

Product Data Sheet

□ Cat # RP-602

Recombinant Human Proguanylin

Size: □ 2 ug

□ 10 ug

**Synonyms:**

Guanylin Precursor, Guanylate cyclase activator 2A, Guanylate cyclase-activating protein 1, Gap-IGUCA2, STARA, GUANYLIN.

**Introduction:**

Heat-stable enterotoxins (STa) are small, cysteine-rich peptides secreted by *Escherichia coli* that are able to induce diarrhea through the stimulation of an intestine-specific receptor-guanylyl cyclase known as STaR. Binding of STa to STaR induces a dramatic increase in the cGMP content of the cell; the increase, in turn, inhibits salt absorption and stimulates chloride secretion. This imbalance of ions is accompanied by a massive accumulation of water in the gut that gives rise to the diarrhea and dehydration characteristic of enterotoxin activity. The identification of a receptor for STa on intestinal brush border membranes suggested the existence of an endogenous activator, described guanylin, a 15-amino acid peptide purified from rat small intestine, as a potential ligand for the STaR. This peptide shares sequence similarity with STa; see also uroguanylin. The molecular cloning of the human and mouse cDNAs encoding guanylin was reported. The sequences demonstrated that guanylin is present at the C-terminal end of a larger precursor protein. Expression in mammalian cells indicated that the 94- amino acid proguanylin is inactive. The biologically active guanylin can be released by either chemical or enzymatic treatment of proguanylin. By Northern blot analysis and *in situ* hybridization, showed that expression of guanylin mRNA is restricted to cells of the intestinal epithelium, specifically the Paneth cells at the base of the small intestinal crypts. These results demonstrate that guanylin is an endogenous activator of STaR isolated a cDNA encoding an apparent precursor of guanylin from a human intestinal cDNA library. The mRNA was expressed at high levels in human ileum and colon. In the mouse, interspecific backcross analysis used to map the Guca2 gene to the distal half of mouse chromosome 4 in a region of homology with human chromosome 1p. By fluorescence *in situ* hybridization mapped the GUCA2 gene to human 1p35-p34. Guanylin is thought to modulate intestinal water/electrolyte transport in a paracrine mode reported the nucleotide sequence of the gene, the characteristics of its circulating molecular form, and its localization in enterochromaffin cells of the gut. The gene, approximately 2.6 kb in size, consists of 3 exons interrupted by 2 introns. The hormonal form of guanylin is a 94-amino acid peptide with a molecular mass of 10.3 kDa. Guanylin is synthesized by gut enterochromaffin cells as a prohormone of 115 amino acids and is processed to the molecular form of 94 amino acids circulating in the blood.

**Description:**

Proguanylin Human Recombinant produced in *E. coli*, is an 11 kDa protein containing 96 amino acid residues of the human proguanylin and 2 additional amino acid residues (underlined).

The Proguanylin is purified by proprietary chromatographic techniques.

GPVTVQDGNF SFSLESVKKL KDLQEPQEPV VGKLRNFAPV PGEVVPVILC SNPNFPEELK PLCKEPNAQE ILQRLEEIAE DPGTCEICAY AACTGC

**Source:**

*Escherichia Coli*.

**Physical Appearance:**

Sterile Filtered White Lyophilized (freeze-dried) powder.

**Formulation:**

Sterile filtered and lyophilized from 0.5 mg/ml in deionized H<sub>2</sub>O.

**Specificity:**

The proguanylin human recombinant is 100% homologous with the human proguanylin.

**Purification Method:**

Three-step procedure using IMAC and size exclusion chromatography before and after refolding.

**Solubility:**

Add 0.2 ml of deionized H<sub>2</sub>O and let the lyophilized pellet dissolve completely.

**Purity:**

Greater than 95.0% as determined by SDS-PAGE.

**Applications:**

Western blotting

**References:**

- Lauber T, Neudecker P, Rosch P, Marx UC. Solution structure of human proguanylin: the role of a hormone prosequence. *J Biol Chem.* 2003 Jun 27; 278(26): 24118-24. Epub 2003 Apr 21. • Lauber T, Nourse A, Schulz A, Marx UC. Native and recombinant proguanylin feature identical biophysical properties and are monomeric in solution. *Biochemistry.* 2002 Dec 10; 41(49): 14602-12. • Rudolph JA, Hawkins JA, Cohen MB. Proguanylin secretion and the role of negative-feedback inhibition in a villous epithelial cell line. *Am J Physiol Gastrointest Liver Physiol.* 2002 Sep; 283(3): G695-702.
- Schulz A, Marx UC, Hidaka Y, Shimonishi Y, Rosch P, Forssmann WG, Adermann K. Role of the prosequence of guanylin. *Protein Sci.* 1999 Sep; 8(9): 1850-9

**Usage:**

This item is for LABORATORY RESEARCH USE ONLY. The product may not be used as drugs, agricultural or pesticidal products, food additives or household chemicals. If supplied in powder then reconstitute it in 100 ul water for 1 mg/ml stock and store in liquid at 4°C for ~1 week or aliquots in suitable size and store at -



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